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Card 3/4

ACCESSION NR: AT4037535

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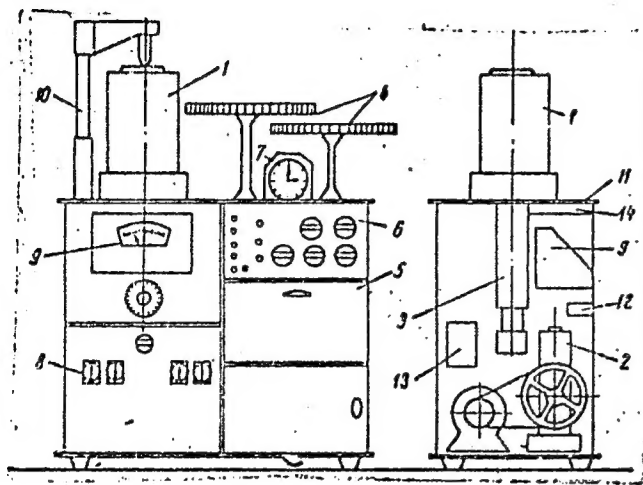


Fig. 1 Overall view of the measuring equipment.

- 1 - vacuum furnace 2 - fore-pump PVN-20 3 - diffusion oil pump MM40A 4 - scales 5 - hinged leaf bench 6 - potentiometer PPTN1 7 - clock with timer 8 - pump, heater, transformer and other switches 9 - vacuum gage dial window 10 - rotating hoist 11 - upper frame plate 12 - adjustable cock 13 - transformer (127/12 v), two-parallel wired auto transformers LATR-1, thermocouple vacuum gage VT-2 14 - fuse box

Card 4/4

LAZAREV, A.I.; TRONINA, Ye.M.

Determination of small amounts of vanadium by catalytic action
of its compounds. Zav.lab. 31 no.3:270-272 '65.

(USSR 1965)

1. Tselinogradskiy sel'ekhozhaystvennyy institut.

2 AZHREO, A. G.

Chem Tetra-tert-butoxysilane. M. G. Voronkov, A. N. Lazarev, and A. K. Balgoshin (Silicate Chem. Inst., Leningrad). *Zhur. Obshchei Khim.* 26, 3072-5 (1954); cf. Brederfeld and Waterman, *C.A.* 49, 8792c; Hyde and Curry, *C.A.* 50, 3218c. — Dry Me₃COH (266.4 g.), 316.4 g. dry pyridine, and 300 ml. dry MePh treated dropwise with 170 g. SiCl₄, heated on a steam bath 10 hrs. with stirring and exclusion of moisture, filtered, and distd. yielded 43.4% (Me₃CO)₄SiCl (I), b_m 202-3°, n_D²⁰ 1.4033, d₄ 0.928. Dry Me₃COH (44.4 g.), 250 ml. dry MePh, and 11.5 g. Na refluxed 6 hrs., cooled, freed of residual Na, transferred to a steel autoclave, 81.9 g. I added, and the mixt. heated 18 hrs. at 220° yielded on distn. a range of materials from which was isolated 45 g. (Me₃CO)₄Si, m. 48.5-0°, b_m 222°, b_m 97°, b_m 68°, d₄ 0.876, n_D²⁰ 1.4028 (supercooled), n_D²⁰ 1.3902; after repeated crystn. from 95% EtOH, it m. 51.5°. Its infrared spectrum was examd. in the solid state and in CS₂; the intense 1063-1053 cm.⁻¹ doublet is ascribed to asym. vibration of the Si-O bond, the 1192 cm.⁻¹ band to C-O vibrations, while the 1242 and 705 cm.⁻¹ bands may be ascribed to C-Me vibrations. The spectrum shows the following bands (cm.⁻¹): 1300 (possibly 2 bands 1267 and 1298), 1242, 1192, 1115 (well shown only by the solid), 1063, 1053, 1027 (these 3 also shown best by the solid), 910 (weak), 831, 705, 690 (weak).
G. M. Kosolapoff

4. FIZIKAL., H. N.

PRIKHOTKO, A. F.

24(7)

3

PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zhurnal, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsterg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Koritakiy, V.O., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Olsherman, A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

- Vol'kenshteyn, M.V., and O.B. Ptitsyn. Behavior of Hydrogen Bonds During Vitrification 437
- Lazarev, A.N. Vibrational Spectra of Orthosilicic Acid Esters and Their Relation to Silicate Spectra 440
- Lotkova, Z.N., V.V. Obukhov-Denisov, N.M. Sobolev, and V.P. Cherenishinov. Raman Spectrum of Vitreous Boric Anhydride 445
- Sidorov, T.A., and N.M. Sobolev. Infrared Spectra and the Structure of Phosphorous, Phosphoric and Boric Anhydrides 448
- Bobovich, Ya. S., and T.P. Tulub. Raman Spectra of Double-complex Silicate Glasses 455
- Sevchenko, N.A., and V.A. Florinskaya. Reflection and Transmission Spectra of Various Modifications of Silica in the Wave Length Range From 7 to 24 Microns 456

LAZAREV, A. N.

48-3-4/26

SUBJECT: USSR/Luminescence

AUTHOR: Lazarev A. N.

TITLE: On the Problem of the Shape of a Potential Curve for Hydrogen Bonds in Some Crystals (K voprosu o forme potentsial'noy krivoy vodorodnoy svyazi v nekotorykh kristallakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya fizicheskaya, 1957, Vol 21, #3, pp 322-328 (USSR)

ABSTRACT: The shape of the potential curve of a hydrogen bond is of importance for the interpretation of physical properties of many crystals, in particular, the nature of ferroelectricity in KH_2PO_4 , Seignette's salt and others. According to modern concepts, the ferroelectric effect in crystals of these salts is connected with the ability of protons to shift along the direction of a hydrogen bond. The infra-red absorption spectrum of KH_2PO_4 was studied in the region of OH valence frequencies. Two smeared bands at 2,625 and 2,445 cm^{-1} frequencies were detected. Landsberg (6) observed bands at 2,800 and 2,500 cm^{-1} frequencies in the combinational

Card 1/2

TITLE:

48-3-4/26
On the Problem of the Shape of a Potential Curve for Hydrogen Bonds in Some Crystals (K voprosu o forme potentsial'noy krivoy vodorodnoy svyazi v nekotorykh kristallakh)
dispersion spectrum. Thus the splitting in the absorption spectrum is larger than in the combinational dispersion spectrum. This fact seems to be an evidence in favor of the tunnel effect hypothesis.

The gypsum absorption spectrum was also investigated, but interpretation of frequencies of its OH-oscillations is in need of further studies.

The article contains 4 spectra, 2 figures and 1 table. The bibliography lists 19 references, of which 8 are Slavic (Russian)
Institute of Silicate Chemistry of the USSR Academy of Sciences

INSTITUTION:

PRESENTED BY:

SUBMITTED:

AVAILABLE:

No date indicated

At the Library of Congress.

Card 2/2

AUTHOR: LAZAREV, A.N. PA - 2147
TITLE: Absorption Spectrum of KH_2PO_4 in the Region of Valence
Vibration of Hydroxyl. (Russian)
PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 2, pp 426 - 427
(U.S.S.R.)
Received: 3 / 1957 Reviewed: 4 / 1957.
ABSTRACT: Since the seignette-electric properties of KH_2PO_4 are brought into connection with the existence of two minima on the energy-curve of the proton in the system $\text{O}\dots\text{H} - \text{O}$ by many authors, KOVNER and KAPSHTAL' ascribed the occurrence of two stripes of OH-valence vibrations in the spectrum of combination-dispersion of the KH_2PO_4 crystal to the tunnel-effect of the proton. If for the case KH_2PO_4 it is assumed that the potential energy of the proton (between two oxygen-atoms) is described by a symmetric curve with two minima but that the occurrence of the two stripes is caused by the tunnel effect no coincidence of frequencies in the absorption spectrum and the spectrum of combination-dispersion is likely to occur. In order to be able to define the form of the stripe of OH-vibrations in the KH_2PO_4 spectrum precisely a method

Card 1/2

PA - 2147

Absorption Spectrum of KH_2PO_4 in the Region of Valence
Vibration of Hydroxyl.

of pressing of transparent plates made of a mixture of the substance to be investigated with potassium bromide-powder was used by the author. This method gives sharper spectra especially in the short wave range. A disadvantage is the presence of water (contained in the potassium bromide) in the spectrum of the absorption stripe. The experimental results are described and it is shown that fission is in all cases essentially less than as computed theoretically by KOVNER and KAPSHTAL. The assumption of a tunnel effect of the proton in KH_2PO_4 must, without doubt, be further experimentally examined. (1Illustration).

ASSOCIATION: Institute for the chemistry of silicates of the Academy of
Science of the U.S.S.R. Leningrad

PRESENTED BY:

SUBMITTED: 29.3.1956.

AVAILABLE: Library of Congress.

Card 2/2

51-4-2-7/22

AUTHORS: Lazarev, A. N. and Voronkov, M. G.

TITLE: Vibrational Spectra of Alkoxysilanes and Siloxanes.
I. Infrared Spectra of Orthosilicic Acid Esters.
(Kolebatel'nyye spektry alkoksisilanov i siloksanov.)
(1. Infrazrasnyye spektry effirov ortokremnevoy kisloty)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, No.2, pp.180-188.
(USSR).

ABSTRACT: The present paper reports measurements of infrared absorption spectra in the 1300-680 cm^{-1} region on 11 orthosilicic acid esters and 1 silicicorganic ortho-carbonic acid ester. Methyl and ethyl esters of orthosilicic acid (Nos.1, 2 in Table 1) were obtained by a reaction of silicon chloride with methyl or ethyl alcohol (Ref.10). The higher tetraalkoxysilanes (Nos.3 - 8 in Table 1) were prepared from silico-methyl or silico-ethyl esters by reaction with appropriate alcohols (Ref.11). Tetratributoxysilane (No.9 in Table 1) was described earlier (Ref.12). Tetrakis(trimethylsiloxy)silane (No.10 in Table 1) was obtained as in Ref.13. Tetrakis(tribenzylsiloxy)silane (No.11) and tetrakis(tribenzylsiloxy)methane (No.12) were supplied by V.S. Chugunov. The properties and the

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51-4-2-7/28

Vibrational Spectra of Alkoxysilanes and Siloxanes. I.

chemical composition of the 12 compounds studied are given in Table 1. The infrared spectra were measured using spectrometers with NaCl prisms. A thermo-element with a photoelectric amplifier (Ref.14) was used as a receiver. Positions of the spectral maxima could be determined to within $\pm 0.03 \mu$ in the spectral region $7.5 - 14.5 \mu$. The majority of the orthosilicic acid esters were studied as solutions in carbon disulphide. Compounds Nos.11 and 12 (in Table 1) were studied as pressed disks made of their powders mixed with KBr. The spectra are given in Figs. 1 - 3, and the frequencies of absorption maxima in Table 2. The authors also discussed identification of bands of valency vibrations of Si-O, C-O and C-C in the 12 compounds studied and in similar substances. There are 3 figures, 2 tables and 27 references, of which 8 are Soviet, 12 English and American, 3 German, 2 French and 2 Dutch.

ASSOCIATION: Institute of Silicate Chemistry, Academy of Sciences
Card 2/3 of the USSR. (Institut khimii silikatov, AN SSSR.)

51-4-2-7/28

Vibrational Spectra of Alkoxysilanes and Siloxanes. I.

SUBMITTED: April 13, 1957.

1. Orthosilicic acid esters-Infrared spectra
analyzers-Applications
2. Infrared spectrum

Card 3/3

51-4-3-28/50

AUTHORS: Lazarev, A.N., Tulub, T.P. and Bobovich, Ia.B.

TITLE: Raman Scattering Spectra of Certain Alkoxy polysiloxanes
(O spektrakh kombinatsionnogo rasseyaniya nekotorykh
alkoksipolisiloksanov.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.3,
pp. 417-418 (USSR)

ABSTRACT: Study of the structure of products of hydrolytic
condensation of esters of orthosilicic acid
(alkoxy polysiloxanes) is of great interest because
of many technical applications of silico-organic com-
pounds. Such studies may be also useful in eluci-
dation of the spectra of silicates. The authors
obtained photographically and photoelectrically Raman
scattering spectra for the following compounds:
 $\text{Si}(\text{OCH}_3)_4$, $(\text{CH}_3\text{O})_3\text{SiOSi}(\text{OCH}_3)_3$, $\text{Si}(\text{OC}_2\text{H}_5)_4$,
 $(\text{C}_2\text{H}_5\text{O})_3\text{SiOSi}(\text{OC}_2\text{H}_5)_3$, $(\text{C}_2\text{H}_5\text{O})_3\text{SiOSi}(\text{OC}_2\text{H}_5)_2\text{OSi}(\text{OC}_2\text{H}_5)_3$.
 The measured values of frequencies in cm^{-1} , of the
 relative intensities and the degree of depolarization
 of lines are given in the table on p.417. To measure
 the intensities and the degree of depolarization of
 lines the photoelectric apparatus described in Ref.1

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51-4-3-28/30
Raman Scattering Spectra of Certain Alkoxy-polysiloxanes
was used. The figure on p.418 gives, by way of
example, the polarized spectra of tetraethoxysilane
(curves a) and hexaethoxydisiloxane (curves b).
A preliminary brief discussion of the results obtained
is given. There are 1 table, 1 figure and 4 references
of which 2 are Soviet, 1 French and 1 Swiss.

ASSOCIATION: State Optics Institute imeni S.I. Vavilov;
Institute for Silicate Chemistry, Academy of Sciences
of the USSR
(Gosudarstvennyy opticheskiy institut im. S.I.
Vavilova, Institut khimii silikatov AN SSSR.)

SUBMITTED: July 15, 1957.

1. Orthosilicic acid--Esters 2. Esters--Hydrolytic con-
densation 3. Alkoxy-polysiloxanes--Scattering 4. Raman
spectra--Applications

Card 2/2

SOV/51-4-6-20/24

AUTHOR: Lazarev, A.N.

TITLE: On Vibrations of Chains of Silicon-Oxygen Tetrahedra (O kolebaniyakh tsepey kremnekislородnykh tetraedrov)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 6, pp 805-806 (USSR)

ABSTRACT: In studies of the infrared absorption spectra of methoxypolysiloxanes in the spectral region 12-24 μ (Ref 4), a weak band was found at 639 cm^{-1} in the spectrum of liquid tetramethoxysilane, which was absent in the spectrum of vapours. In the Raman spectrum a strong polarized line (Ref 2), due to the fully-symmetric valence vibration of the SiO_4 group was found to correspond to this absorption band. Such a vibration in the $\text{Si}(\text{OCH}_3)_4$ belongs to the A_1 type of symmetry, which is the same symmetry as in isolated SiO_4 tetrahedron. In the tetramethoxysilane dimer and trimer two and three such absorption bands are found respectively. These bands have the corresponding members in the Raman spectrum. In the case of the pentamer the number of such absorption bands increases to 5 and in the heptamer there are 7 such bands. These results are shown in the figure on p. 806. In the higher polymers of methoxypolysiloxanes the number of such bands does not increase. Similar behaviour was observed in the spectra of ethoxypolysiloxanes. The observed splitting of the fully-symmetric

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SOV/51-4-6-20/24

On Vibrations of Chains of Silicon-Oxygen Tetrahedra

vibration of the SiO_4 tetrahedron is due to formation of a chain of coupled vibrators consisting of the SiO_4 groups. Among the components into which the fully-symmetric vibration is split, that with the highest frequency is the most intense in the absorption spectrum while the lowest frequency one is strongest in the Raman spectrum. The central, and displaced component has high intensity in the absorption spectrum, even in the heptamer. The results obtained make it possible to identify spectroscopically low-molecular-weight linear and cyclic alkoypolysiloxanes. The author thanks M.G. Voronkov who prepared the studied substances. There are 1 figure and 5 references, 3 of which are Soviet, 1 Swiss and 1 mixed (Soviet and German).

ASSOCIATION: Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, Academy of Sciences of the U.S.S.R.)

SUBMITTED: December 24, 1957
Card 2/2

AUTHORS: Lazarev, A.N., Voronkov, M.G. and Tenisheva, T.F. SOV/51-5-4-3/21

TITLE: On Vibrations of Si--O--Si and Si--CH₂--Si bonds in Hexachlorodisiloxane and in Si-hexachlorodisilmethane (O kolebaniyakh svyazey Si-O-Si i Si-CH₂-Si v geksakhlordisiloksane i Si-geksakhlordisilmetane)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 4, pp 365-368 (USSR)

ABSTRACT: The authors measured the frequencies and polarization states of the strongest lines in the Raman spectra of hexachlorodisiloxane Cl₃SiOSiCl₃ and Si-hexachlorodisilmethane Cl₃SiCH₂SiCl₃. The infrared spectra of vapours of these compounds were also obtained and they are given in Fig 1. The Raman spectra were measured using an ISP-51 spectrograph. The infrared absorption spectra were obtained using a single-beam vacuum spectrometer VIKS-M3 with a NaCl prism and an ISP-15-b spectrometer with a KBr prism. The results obtained and their interpretation are given in the table on p 366. The spectra were discussed assuming C_{2v} symmetry for these molecules. The strong absorption band at 1131-1170 cm⁻¹ was ascribed to antisymmetrical valence vibrations of the Si--O--Si bond in Cl₃SiOSiCl₃. The intense

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SOV351-5-4-3/21

On Vibrations of Si--O--Si and Si--CH₂--Si bonds in Hexachlorodisiloxane and in Si-hexachlorodisilmethane

polarization Raman line at 353 cm⁻¹ was due to symmetrical valence vibrations of the Si--O--Si bond in the same molecule. In the Cl₃SiCH₂SiCl₃ spectrum the 308 cm⁻¹ Raman line corresponds to symmetrical vibrations and the 800 cm⁻¹ absorption band corresponds to antisymmetrical vibrations of the Si--C--Si bond. Deformational vibrations of the Si--O--Si and Si--C--Si bonds are probably responsible for the 274 cm⁻¹ (or 329 cm⁻¹) and 246 cm⁻¹ lines. Of the four deformational vibrations of the CH₂ group in the Cl₃SiCH₂SiCl₃ spectrum the internal deformational vibrations are represented by the 1340 cm⁻¹ frequency and the external vibrations

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SOV/51-5-4-3/21

On Vibrations of Si--O--Si and Si--CH₂--Si bonds in Hexachlorodisiloxane and in Si-hexachlorodisilmethane

are responsible for the 1080 and probably 690 cm⁻¹ bands. There are 1 figure, 1 table and 7 references, 3 of which are American, 3 German and 1 Soviet.

ASSOCIATION: Institut khimii silikatov, AN SSSR (Institute of Silicate Chemistry, Academy of Sciences of the U.S.S.R.)

SUBMITTED: March 28, 1958

Card 3/3 1. Silicones--Spectra 2. Methanes--Spectra 3. Raman spectra
4. Infrared spectra 5. Molecules--Vibration

NOV 7 1958

AUTHORS: Voronkov, M. G., Davydova, V. P., Lezarev, A. N.

TITLE: Investigations in the Field of Alkoxy Silanes (issledovaniya v oblasti alkoksissilanov) XII. Hexa-Tert.-Butoxy-cyclo-tri-siloxane (XII. Geksa-tret.-butoksitsiklotrisiloksan)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 3, pp. 2128-2131 (USSR)

ABSTRACT: Polydialkoxy-cyclosiloxanes $[(RO)_2SiO]_n$ have hitherto been synthesized according to the hydrolysis reaction (Refs. 1-4),

$$n(RO)_2SiX_2 + nH_2O \longrightarrow [(RO)_2SiO]_n + 2nHX, \text{ where } R = C_2H_5, C_4H_9;$$

 $X = Cl, OC_2H_5, NH_2; n=3-8.$
 The authors observed a very interesting case of formation of a previously unknown hexa-tert.-butoxy-cyclotrisiloxane by the way of an intermolecular condensation of the tri-tert.-butoxy-acetoxysilane in a tert.-butyl alcohol medium in the presence of tert.-sodium butylate according to scheme 2.
 Such a reaction under formation of a siloxane compound at

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307/79-28-3-12/66

Investigations in the Field of Alkoxy Silanes.
XII. Hexa-Tert.-Butoxycyclo Trisiloxane

the expense of the alkoxy- and acyloxy silane condensation (Scheme 3) has hitherto been known to an only small extent in the organosilicon chemistry. The main product of the above mentioned reaction is the completely resistant cyclic trisiloxane and not, as expected, the tetrasiloxane. This circumstance is assumed to be caused by the influence of the tert.-butoxy groups. Hexaethoxy-cyclotrisiloxane is, in contrast to octaethoxy-cyclotetrasiloxane, obtained only with difficulty and is very unstable. The infrared absorption spectrum of the hexa-tert.-butoxy-cyclotrisiloxane was investigated. Its interpretation permits to draw several conclusions on the structure of the cycle. This is shown by the figure. There are 1 figure and 22 references, 9 of which are Soviet.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR
(Institute of the Chemistry of Silicates, AS USSR)

SUBMITTED: July 11, 1957

Card 2/3

Investigations in the Field of Alkoxy Silanes.
XII. Hexa-Tert.-Butoxycyclo Trisiloxane

SOV/79-28-8-29/66

Card 3/3

LAZAREV, A.N.; ZAYTSEVA, A.S.

Valency vibrations of the hydroxyl group in seignetic electric
crystals of KH_2PO_4 and KD_2PO_4 . Fiz. tver. tela 3 no. 12:3026-
3028 D '60. (MIRA 14:2)

1. Institut khimii silikatov AN SSSR.
(Hydroxyl group—Spectra) (Potassium phosphate crystals)

S/051/60/008/04/013/032
3201/E691

AUTHOR: Lazarev, A.N.

TITLE: The Vibrational Spectra of Alkoxysilanes and Siloxanes. II. Vibrations of the SiO_4 Groups in the Spectra of Tetraalkosilanes ¹

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 4, pp 511-515 (USSR)

ABSTRACT: The author recorded the vibrational spectra of four tetra-n-alkoxysilanes. The frequencies, intensities and polarizations of the Raman lines are given in Tables 1 and 3. Fig 2 shows the infrared absorption spectra in the $800-420 \text{ cm}^{-1}$ region (the absorption spectra in the $1300-700 \text{ cm}^{-1}$ region were reported earlier, cf. Ref 6). The Raman spectra were recorded both photographically (glass spectrographs with linear dispersions of 25 and 18 Å/mm in the 4358 Å region) and photoelectrically (polarization measurements). The infrared spectra were obtained with a spectrometer ISP-14b (NaCl and KBr prisms) and with a vacuum spectrometer and an NaCl prism. The four substances were investigated both as pure liquids and as solutions in CS_2 and CCl_4 . The absorption spectrum of tetramethoxysilane $[\text{Si}(\text{OCH}_3)_4]$ vapours was also obtained (Fig 3). The assignment of the frequencies in the spectrum of $\text{Si}(\text{OCH}_3)_4$ is given in Table 1. A similar assignment for $\text{Si}(\text{OC}_2\text{H}_5)_4$ is given

and 1/2

S/051/60/008/04/013/032
K201/K691

The Vibrational Spectra of Alkoxysilanes and Siloxanes. II. Vibrations of the SiO_4 Groups in the Spectra of Tetraalkosilanes

in Table 2. In the spectra of $\text{Si}(\text{OC}_3\text{H}_7\text{-n})_4$ and $\text{Si}(\text{OC}_4\text{H}_9\text{-n})_4$, listed in Table 3, only the frequencies of the symmetrical vibrations of Si--O and the intense bands of C--O (near $1090\text{--}1100\text{ cm}^{-1}$) could be identified. The author discusses also the valence vibrations of the molecular skeletons, especially those of SiO_4 groups, and deals with the possibility of using the spectra of orthosilicic acid esters to interpret the similar spectra of silicates. There are 3 figures, 3 tables and 14 references, 7 of which are Soviet, 2 English, 1 German, 1 French, 1 Swiss, 1 Japanese and 1 mixed (French and Japanese).

SUBMITTED: July 6, 1959

Card 2/2

S/051/60/008/005/004/027
E201/E491

AUTHORS: Lazarev, A.N. and Voronkov, M.G.
TITLE: Vibrational Spectra of Alkoxysilanes and Siloxanes.
III. Vibrations of Silicon-Oxygen Chains in the Spectra
of Polyalkoxysiloxanes ↑

PERIODICAL: Optika i spektroskopiya, 1960, Vol.8, No.5, pp.614-622

TEXT: The structure of polyalkoxysiloxane molecules resembles in many respects the structure of silicates. To establish a correlation between the structure and the vibrational spectra of polyalkoxysiloxanes and silicates two problems had to be solved. Firstly, it was necessary to identify the frequencies of normal vibrations of the SiO_4 group and this was done by investigation of the spectra of orthosilicates (Ref.1, 2) and the spectra of SiO_4 ions in solution (Ref.3); vibrations of the SiO_4 group in the spectra of tetraalkoxysilanes, $\text{Si}(\text{OR})_4$, were discussed in an earlier communication (Ref.4). Secondly, it was necessary to study changes in the vibrations of silicon-oxygen tetrahedra on polymerization; this is dealt with in the present paper. The authors investigated the vibrational spectra of polymethoxysiloxanes and polyethoxysiloxanes with various numbers of SiO_4 tetrahedra

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S/051/60/008/005/004/027
E201/E491

Vibrational Spectra of Alkoxysilanes and Siloxanes.
III. Vibrations of Silicon-Oxygen Chains in the Spectra of
Polyalkoxysiloxanes

in the molecular chain. Polymethoxysiloxanes and polyethoxysiloxanes were prepared by hydrolysis of large amounts (1 to 1.5 kg) of $\text{Si}(\text{OCH}_3)_4$ and $\text{Si}(\text{OC}_2\text{H}_5)_4$ in a medium of the appropriate alcohol and with HCl as a catalyser. Polyalkoxysiloxanes were separated by repeated fractional sublimation in vacuum in the presence of traces of phosphoric acid. Physical constants of the first members of polymethoxysiloxane and polyethoxysiloxane families are given in Table 1, together with results of chemical analysis of these compounds. The infrared absorption spectra of polymethoxysiloxanes are shown in Fig.1 and those of polyethoxysiloxanes in Fig.2. The vibrational frequencies of polymethoxysiloxanes are listed in Table 2 and those of polyethoxysiloxanes are given in Table 3. Table 4 gives the selection rules for vibrations of the SiO_4 and Si_2O_7 groups and Table 5 lists the valence vibrations of the Si_2O_7 groups. Analysis of the results obtained showed that changes in the spectra of

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S/051/60/008/005/004/027
E201/E491

Vibrational Spectra of Alkoxysilanes and Siloxanes.
III. Vibrations of Silicon-Oxygen Chains in the Spectra of
Polyalkoxysiloxanes

polyethoxysiloxanes with increase of the degree of polymerization can be interpreted as due to changes in vibrations of the SiO_4 groups when the latter are joined into a chain. This makes it possible to use polyalkoxysiloxanes as organic "models" of silicates. There are 2 figures, 5 tables and 7 references: 3 Soviet, 2 English and 2 German. ✓

SUBMITTED: August 11, 1959

Card 3/3

S/051/60/009/002/008/013/XX
E201/E491

AUTHOR: Lazarev, A.N.

TITLE: Vibrational Spectra of Silicates. I. Infrared Spectra²¹
of Silicates with Anions of the $[\text{Si}_2\text{O}_7]^{6-}$ Type

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.2, pp.195-202

TEXT: The author reports a study of the infrared absorption spectra of several silicates containing complex anions of the $[\text{SiO}_4]^{4-}$ and $[\text{Si}_2\text{O}_7]^{6-}$ type. The majority of these silicates were natural minerals obtained from the Mineralogical Museum, AS USSR and the Museum of the Mining Institute. Three calcium silicates were prepared in the Physico-Chemical Laboratory of the Silicate Chemistry Institute, AS USSR. Calcium diorthosilicate (rankinite, $3\text{CaO} \cdot 2\text{SiO}_2$) was synthesized (by firing) by the authors from a mixture of calcite and rock crystal (a form of colourless quartz). The infrared absorption spectra were recorded with spectrometers БУКC-M3 (VIKS-MZ), with an NaCl prism, and ИСП-14b (ISP-14b) with a KBr prism. Samples were in the form of pressed disks made of mixtures of KBr powder and one of the silicates, or in the form of suspensions in paraffin oil. Fig.1 shows the absorption spectra of $\text{Ca}_3\text{O}(\text{SiO}_4)$ (curve 1), $\gamma\text{-Ca}_2\text{SiO}_4$ (curve 2), $\beta\text{-Ca}_2\text{SiO}_4$ (curve 3) and $\text{Ca}_3\text{Si}_2\text{O}_7$ (curve 4). The absorption Card 1/2

S/051/60/009/002/008/013/XX
E201/E491

Vibrational Spectra of Silicates. I. Infrared Spectra of Silicates with Anions of the $[\text{Si}_2\text{O}_7]^{6-}$ Type

spectra of Zn_2SiO_4 (curve 1), $\text{Zn}_4(\text{OH})_2(\text{Si}_2\text{O}_7) \cdot \text{H}_2\text{O}$ (curve 2) and $\text{Ca}_2\text{ZnSi}_2\text{O}_7$ (curve 3) are given in Fig.2. The absorption spectrum of $\text{CaFe}_2\text{FeO}(\text{Si}_2\text{O}_7)\text{OH}$ is shown in Fig.4. A table on p.197 lists the frequencies of maxima in the infrared absorption spectra of the eight silicates dealt with in Figs.1,2 and 4. Transition from orthosilicates to pyrosilicates was accompanied by characteristic changes in their vibrational spectra, shown in Fig.3, mainly due to changes in the normal vibrations of SiO_4 tetrahedra when they are joined together to form Si_2O_7 groups. The vibrational spectra of Si_2O_7 groups may be used to confirm the presence of such groups in silicate crystals and to estimate approximately the SiOSi angle in Si_2O_7 . When light cations are present they interact strongly with anions and the pyrosilicate spectra can no longer be analysed by using the idea of "isolated" Si_2O_7 groups. Acknowledgments are made to Ye.F.Gross and N.A.Toropov for their advice and to A.I.Bovkova and Yu.G.Sokolov for their help in microscopic and X-ray diffraction analyses. There are 4 figures, 1 table and 20 references: 6 Soviet, 5 English, 7 German and 2 international.

SUBMITTED: November 14, 1959
Card 2/2

S/020/60/135/004/027/037
BC 16/B066

AUTHORS: Shchukovskaya, L. L., Petrov, A. D., Corresponding Member
AS USSR, and Lazarev, A. N.

TITLE: High-temperature Condensation of Chloroprene With Methyl
Silane Dichloride

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 4, pp. 883-885

TEXT: The authors studied the high-temperature condensation of chloroprene
with methyl silane dichloride: 1) at 550-580°C and 2) at 590-600°C. Ad 1)
Two principal fractions: I (Boiling point 68.5 - 70°C/18 mm Hg) and II
(88 - 90°C/0.5 mm Hg) were obtained by fractionation after treatment with
 C_2H_5MgBr . In one of these fractions the expected methyl diethyl silyl buta-
diene $CH_2=C-CH=CH_2$ was found. It contains at least 50% of allene isomer
 $CH_3Si(C_2H_5)_2$
and up to 5% chlorine. Chlorine was also contained in the dimer fraction:
 $[CH_3(C_2H_5)_2Si-CH=CH-CH=CH_2]_2$. Ad 2) Each of the 11 fractions obtained

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High-temperature Condensation of Chloroprene
With Methyl Silane Dichloride

S/020/60/135/004/027/037
B016/B066

was methylated and then fractionated. Only 5 fractions were studied:

Fraction	Boiling Point
A	111.5-113°C/748 mm Hg
B	71°/64 mm Hg
V	75°/30 mm Hg
	74°/28 mm Hg
G	86°/20 mm Hg
D	62-64°/3 mm Hg

In this case the yield of condensate was higher: up to 50 %, calculated for the chloroprene reacted. The reaction product could be methylated by CH_3MgBr . In addition to $\text{CH}_2=\text{C}[\text{Si}(\text{CH}_3)_3]-\text{CH}=\text{CH}_2$ (isomer mixture) the authors isolated and identified styrene (10 % yield). They regard the latter fact as proof for a partial reduction of the chlorine of chloroprene and also for a dehydrogenation, as the styrene is apparently formed via the vinyl cyclohexene. But styrene could also have resulted via butadiene. The authors further isolated a disilane to which they ascribed the empirical formula $\text{C}_{10}\text{H}_{22}\text{Si}_2$ and a presumable structure: $(\text{CH}_3)_3\text{SiCH}=\text{CH}-\text{CH}=\text{SHSi}(\text{CH}_3)_3$, which however, could not be confirmed. The disilane was probably formed according

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High-temperature Condensation of Chloroprene
With Methyl Silane Dichloride

S/020/60/135/004/027/037
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to the scheme: $(\text{CH}_2=\underset{\text{Si}(\text{CH}_3)_3}{\text{C}}-\text{CH}=\text{CH}_2)_2 \longrightarrow \text{C}_4\text{H}_6 + (\text{CH}_3)_3\text{SiCH}=\text{CH}-\text{CHSi}(\text{CH}_3)_3$ (I)

But its spectrum is in contradiction with this formula. This disilane adds both 2 and 4 bromine atoms. The fraction D much resembled the α -trimethyl silyl vinyl cyclohexadiene (see the terminal member of the attached scheme II), it may be formed according to this scheme. R. I. Pal'chik took part in the experimental section of this paper. There are 2 Soviet references.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry of the Academy of Sciences USSR)

SUBMITTED: August 18, 1960

Card 3/4

S/661/61/000/006/064/091
D243/D302

AUTHORS: Lazarev, A. N. and Voronkov, M. G.

TITLE: Oscillations of the bonds of silico-oxygen tetrahedrons in the spectra of polyalkoxysiloxanes

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad, Izd-vo AN SSSR, 1961, 283-285

TEXT: This is a discussion of the authors' paper (this publication, no. 3, p. 52) in which Yu. P. Yegorov (IOKh AN SSSR, Moscow) and P. G. Maslov (Leningrad) took part. The authors stated that their results could not be compared with those of Stepanov and Prim, due to simplifications introduced by the latter authors. The theoretical interpretation of metasilicate spectra is thought to be far from complete. The symmetrical oscillation of the SiO_4 group was studied because its higher sensitivity permitted a more detailed investigation.

Card 1/2

LAZAREV, A.N.; TENISHEVA, T.F.

Vibration spectra and structure of some rare earth silicates. Izv.
AN SSSR. Otd. khim. nauk no. 6: 964-973 Je '61. (MIRA 14:6)

1. Institut khimii silikatov Akademii nauk SSSR.
(Rare earth silicates—Spectra)

LAZAREV, A.N.; TENISHOVA, T.P.

Vibrational spectra of silicates. Part 2: Infrared absorption
spectra of silicates and germanates with anion chains. Opt. i
spektr. 10 no. 1:79-85 Ja '61. (MIRA 14:1)
(Silicates--Spectra) (Germanates--Spectra)

S/051/61/011/005/004/018
E202/E192

AUTHORS: Lazarev, A.N., and Tenisheva, T.F.

TITLE: Vibrational spectra of silicates. III. Infrared spectra of pyroxenoides and other chain metasilicates

PERIODICAL: Optika i spektroskopiya, v.11, no.5, 1961, 584-587

TEXT: Recent X-ray work elucidating the structure of silicate chains of wollastonite, rhodonite and pyroxmanganite in terms of recurring 3, 5 and 7 (SiO₄) tetrahedrons respectively, made the authors study the vibrational spectra of these compounds in order to predict such identity periods purely on the grounds of spectroscopic methods. In the spectrum of wollastonite in the interval 560 - 680 cm⁻¹, three narrow medium intensity bands were found, most likely due to ν_s (SiOSi) chain of the type $[(SiO_3)_3]_{\infty}$. Rhodonite, whose chain is $[(SiO_3)_5]_{\infty}$, showed six bands instead of five. The extra band was thought to be due either to contamination or to the splitting of the internal anion vibrations. Pyroxmanganite

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Vibrational spectra of silicates. ... S/051/61/011/005/004/018
E202/E192

gave the expected seven absorption bands corresponding to its X-ray structure of $[(\text{SiO}_3)_7]_{\infty}$. The method failed in the case of bustamite $(\text{Ca}, \text{Mn})\text{SiO}_3$ whose spectrum could not be interpreted. However, it was successful with metagermanate, CaGeO_3 , where it was found that the identity period is three. The authors stress that the usefulness of their method decreases with the increasing number of the tetrahedrons in the identity period, since it leads to very narrow band separations and poor relative intensities. Acknowledgments are expressed to Kh.S. Manedov and A.I. Boykova for providing the mineral samples. ✓

There are 4 figures, 2 tables and 8 references; 3 Soviet-bloc and 5 non-Soviet-bloc.

SUBMITTED: December 13, 1960

Card 2/2

LAZAREV, A.N.

Problem of Si-O bonds and interatomic distances in silicates.
Zhur.ob.khim. 31 no.12:4061-4062 D '61. (MIRA 15:2)

1. Institut khimii silikatov AN SSSR.
(Silicates)
(Chemical bonds)

LAZAREV, A.N.; TENISHEVA, T.F.; GREBENSHCHIKOV, R.G.

Structure of barium silicates. Dokl. AN SSSR 140 no.4:811-814
O '61. (MIRA 14:9)

1. Institut khimii silikatov AN SSSR. Predstavleno akademikom
N.V.Belovym.

(Barium silicate crystals)

S/062/62/000/004/002/013
B110/B101

AUTHORS: Lazarev, A. N., Tenisheva, T. F., Bondar', I. A., and
Koroleva, L. N.

TITLE: Structure of pyrosilicates of rare-earth elements

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye
khimicheskikh nauk, no. 4, 1962, 557-560

TEXT: The jumplike structural change of RE pyrosilicates is explained as follows: The coordination number or the shape of the coordination polyhedron of R^{3+} cations is assumed to change at some critical ratios of the dimensions of metal and oxygen ions. This assumption is supported by the fact that the europium ion Eu^{3+} lies at the boundary between the first (La - Sm) and the second (Gd - Ho, Y) group types of rare earths with different pyrosilicate structures. The infrared spectrum showed that pure $Eu_2Si_2O_7$ crystallized with a structure corresponding to the first group. Infrared spectra of $Eu_2Si_2O_7$ with $\leq 3\%$ impurities of other rare

Card 1/3

Structure of pyrosilicates of ...

S/062/62/000/004/002/013
B110/B101

earths, synthesized from europium oxide, showed superposition of spectra of first- and second-type pyrosilicates. Thus, two crystalline phases existed with nearly equal concentrations. Addition of 5 mole% of yttrium oxide effected crystallization of 80-90% of pyrosilicate with a structure corresponding to the second group. Gadolinium with nearly equal ionic radius caused no structural change whereas dysprosium entirely converted $\text{Eu}_2\text{Si}_2\text{O}_7$ to the second-type pyrosilicate. Small RE additions caused crystallization in two different types, but an intermediate structure has never been observed. This jumplike transition indicates that no continuous series of solid solutions is formed in binary systems of $(\text{R}, \text{R}')_2\text{Si}_2\text{O}_7$, where R and R' are atoms of rare earths of various groups. In the system $(\text{La}_{1-x}, \text{Yb}_x)_2\text{Si}_2\text{O}_7$, the infrared spectra show superposition of spectra of first- and third-group pyrosilicates at $x = 0.5-0.9$ (two-phase character). Similar observations were made for $(\text{Y}_{1-x}, \text{Er}_x)_2\text{Si}_2\text{O}_7$ at $0.4 < x < 0.8$. X-ray and microscopic studies showed the formation of limited solid solutions also for systems of hydroxyortho- or orthosilicates. An unimportant shift of the band of symmetrical

Card 2/3

Structure of pyrosilicates of ...

S/062/62/000/004/002/013
B110/B101

stretching vibrations of SiOSi ((La, Yb)₂Si₂O₇: 728-717 cm⁻¹;
(Y, Er)₂Si₂O₇: 635-632 cm⁻¹) confirmed the preservation of the
Si₂O₇ group characteristic of this structure (the SiOSi angle).
No intermediate structure could be observed here either. There are
3 figures.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR
(Institute of Silicate Chemistry of the Academy of
Sciences USSR)

SUBMITTED: November 2, 1961

Card 3/3

S/062/62/000/007/013/011
B117/B180

AUTHOR:

Lazarev, A. N.

TITLE:

Inversion transition of oxygen atoms into Si-O-Si and P-O-P bonds

PERIODICAL:

Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 7, 1962, 1314

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ASSO

SUBMIT

TEXT: Vibrational spectra of a number of pyrophosphates and pyrosilicates were studied on the assumption that the energy of σ -bonds, which decreases with increasing XOx angle and transition of the oxygen atom from the electron configuration sp^3 to sp^2 and sp , is at least partly compensated by the increasing energy of the $dx - px$ bonds of $X-O(X)$. The $X - O - X$ bridge in the X_2O_7 ion of $Mg_2P_2O_7$ and ZrP_2O_7 altered from a bent to a centrosymmetrical shape (~ 70 and 300° , respectively). This is due to the thermal excitement of the inversion transition of the oxygen atom into a position of equivalent symmetry with respect to the axis $X \dots X$. In SiO_2 , and Sc , Er , and Yb pyrosilicates isomorphic with the high-tempera-

33639

S/051/62/012/001/007/020
E202/E492

5.5310

1273, 1334 1153

AUTHOR:

Lazarev, A.N.

TITLE:

Vibrational spectra of silicates
IV. Interpretation of silicates and germanate spectra
with ring anions

PERIODICAL: Optika i spektroskopiya, v.12, no.1, 1962, 60-65

TEXT: This is the continuation of a large project on the vibrational spectra of silicates and is to be followed by a study of the "quadruplet" and "two-storey" ring anions of silicates. The object of the present work was the qualitative interpretation of the bands in the valency vibrations in the spectra of the ring anions X_3O_9 and X_6O_{18} , of silicates and germanates and also the study of the relations between the crystal symmetry and the laws of selection and polarization of the vibrations. Such relations could be used to determine the position of the anions within the crystal. Earlier work of the author and others (Ref.6: Opt. i spektr., v.10, 1961, 79; v.11, 1961, 584) suggests that the spectra of silicates with "triple" ring $[Si_3O_9]^{6-}$ should have the bands of three vibration $\nu_s(SiOSi)$ in the frequency region below

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S/051/62/012/001/007/020
E202/E492

Vibrational spectra ...

750 to 800 cm^{-1} . One of these vibrations belongs to the fully symmetrical type while the remaining two are mutually degenerate. In the higher frequency region there should also be bands of the three $\nu_{\text{as}}(\text{SiOSi})$ vibrations, and six bands corresponding to the symmetric and antisymmetric vibrations of the O^-SiO^- groups, where two in each of the three vibrations should belong to the degenerate symmetry type. The spectroscopic study on benitoite, katapleite and high temperature form of strontium germanate, all of which have the D_{3h} symmetry, confirmed these expectations. Most of the spectroscopic samples were prepared in the form of KBr pressings. Detailed analysis of each spectrum was included giving the complete types of vibrational symmetries and selection rules in the IR and Raman spectra for the four vibrations (i.e. ν_{as} ; $\nu_{\text{s}}(\text{XOX})$; and ν_{as} ; $\nu_{\text{s}}(\text{O-XO-})$). The second type of anion, viz. $[\text{Si}_6\text{O}_{18}]^{12-}$, was studied largely on diopside, whose ring anion has the symmetry $S_6 \cong C_{3i}$. The spectrographic samples were also pressed with KBr. The interpretation of the IR spectrum was carried out with reference to the textbook (Ref.3: I.I.Plyusnina, G.B.Bokiy. Kristallografiya, Card 2/3

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Vibrational spectra. ...

S/051/62/012/001/007/020
E202/E492

v.3, 1958, 752) and the doublet structure of the absorption band explained. Detailed analysis of the valency vibrations of this anion was also given, including the types of symmetry and the selection rules of each symmetric and antisymmetric (O^-SiO^-) and ($SiOSi$) vibrations. I.I.Plyusnina, G.B.Bokiy and A.M.Prima are mentioned in the article in connection with their contributions in this field. G.P.Stavitskaya supplied the initial SrH_2GeO_4 sample. There are 3 figures, 2 tables and 24 references: 10 Soviet-bloc, 1 Russian translation from non-Soviet-bloc work and 13 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.4: F.Matossi. J. Chem. Phys., v.17, 1949, 679; Ref.11: H.Winston, R.S.Halford. J. Chem. Phys., v.17, 1949, 607; Ref.21: J.W.Jeffery, L.Heller. Acta Crystallogr., v.6, 1953, 807; Ref.23: H.G.Heide, K.Boll-Dornberger, E.Thilo, E.M.Thilo. Acta Crystallogr., v.8, 1955, 425.

SUBMITTED: December 22, 1960

Card 3/3

LAZAREV, A.N.; TENISHEVA, T.F.

Vibrational spectra of silicates. Part 5. Silicates with
bandlike anions. Opt. i spektr. 12 no.2:215-219 F '62.
(MIRA 15:2)

(Silicates--Spectra)
(Anions)

S/051 /62/013/005/011/017
E039/E520

AUTHORS:

Lazarev, A.N. and Tenisheva, T.F.

TITLE:

On the vibrational spectra of mixed crystals in
the Li_2SiO_3 - Li_2GeO_3

PERIODICAL:

Optika i spektroskopiya, v.13, no.5, 1962, 708-713

TEXT:

It was shown previously that the vibrational spectra of the alkali metasilicates and metagermanates M_2XO_3 can be interpreted (in the frequency region of valency oscillations X-O) by means of a "one-dimensional crystal" model, i.e. from an examination of the normal oscillations of isolated bonds $(\text{X}_2\text{O}_6)_\infty$. An attempt is made to extend this model to the case of mixed crystals. Li_2SiO_3 and Li_2GeO_3 were chosen for this experiment as they crystallise well from a melt, are less hygroscopic and possess sharper bands in their infrared spectra than the corresponding sodium salts. Fusion of the mixed crystals $\text{Li}_2(\text{Si}_x\text{Ge}_{1-x})\text{O}_3$ was carried out in a platinum crucible at 1250 to 1350°C, using Li_2CO_3 , SiO_2 and GeO_2 . Samples were

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On the vibrational spectra ...

S/051/62/013/005/011/017
E039/E520

obtained for $x = 1.0, 0.9, 0.8, 0.6, 0.4, 0.2, 0.1$ and 0 . Well formed single phase crystals were produced with refractive indices changing linearly with composition. Measurements of X-ray scattering confirmed that the crystals formed solid solutions for all compositions. Infrared spectra were obtained in the wave-number range 1300 to 400 cm^{-1} . The change in structure of these spectra with composition is tabulated and discussed in detail. Only the 761 cm^{-1} line for the (O^-GeO^-) bond in Li_2GeO_3 occurs throughout the range up to 90% Si; other lines associated with this bond do not persist beyond 40% Si. The 582 cm^{-1} line associated with the $(\text{Ge},\text{O},\text{Ge})$ bond persists throughout the range, its frequency increasing to 595 cm^{-1} for 90% Si. Similarly, the 1055 and 973 cm^{-1} lines associated with the (O^-SiO^-) bond in Li_2SiO_3 persist to compositions containing 90% Ge. Other lines characteristic of the mixed crystals, due to the $(\text{Si},\text{O},\text{Ge})$ bond, have frequencies of $890, 784$ to 816 and 659 to 670 cm^{-1} . There are 4 figures and 1 table.

SUBMITTED: September 12, 1961

Card 2/2

LAZAREV, A.N.

Polymorphism of molecules and complex ions in oxygen compounds of silicon and phosphorus. Report No.1: Nature of Si-O-Si bonds and the values of valence angles of oxygen. Izv.AN SSSR.Ser. khim. no.2:235-241 F '64.

(MIRA 17:3)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR.

LAZAREV, A.N.; TENISHEVA, T.F.

Polymorphism of molecules and complex ions in oxygen compounds of silicon and phosphorus. Report No.2: Mechanism of phase transition in $Mg_2P_2O_7$. Izv.AN SSSR.Ser.khim. no.2:242-248 F 164.

(MIRA 17:3)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR.

LAZAREV, A.N.; TENISHEVA, T.F.

Polymorphism of molecules and complex ions in oxygen compounds of silicon and phosphorus. Report No.3: "Centrosymmetrical" anions X_2O_7 . Izv. AN SSSR. Ser.khim. no.3:403-409 Mr '64. (MIRA 17:4)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR.

L 23526-65 EWT(m)/EFF(c)/EWP(j) Pc-4/Pr-4 FM
ACCESSION NR: AP4046377 S/0020/04/158/003/0648/0651

AUTHOR: Lazarev, A. N.; Tenisheva, T. F.; Davydova, V. P.

TITLE: The mutual effect of Si-O⁻ and Si-O(Si) type bonds 1

SOURCE: AN SSSR. Doklady*, v. 158, no. 3, 1964, 648-651

TOPIC TAGS: terminal Si O bond, bridge Si O bond, IR spectra, tetramethyldisiloxanediolate 1

ABSTRACT: The mutual effect of terminal and bridge Si-O bonds in $\text{XO}(\text{CH}_3)_2\text{SiOSi}(\text{CH}_3)_2\text{OX}$ type compounds ($\text{X} = \text{H}, \text{Li}, \text{Na}, \text{K}$) was studied. The IR spectra were obtained and the shifts in the frequencies of the absorption maxima were interpreted. The shifts were most noticeable when going from $\text{X} = \text{H}$ to $\text{X} = \text{Li}, \text{Na}, \text{K}$. Although the calculated data did not give the absolute parameters of the molecules, it showed that as the dynamic coefficient of the Si-O(H, K) bond increased the coefficient of the Si-O(Si) bond decreased by approximately the same value (6-9%) and the SiOSi angle decreased by 8-10 degrees. These

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L 23526-65
ACCESSION NR: AP4046377

values directly characterized the redistribution of the $d\pi - p\pi$ interaction in the Si-O⁻ and Si-O(Si) bonds. The intensification of the $(p \rightarrow d)\pi$ interaction in the Si-O⁻ bond, caused by the increased electron density on the O atom lowered the effective positive charge of the Si d- orbit, decreasing the order of the Si-O(Si) bond. Similar but smaller shifts in the SiOSi frequencies occurred when X = Li, Na. On the other hand the increase in the SiO⁻ frequency was significantly larger, probably due to the smaller atom mass of Li and Na in comparison to K. The sharp splitting of the $\nu_{as}SiOSi$ when X = Li was explained by intramolecular effects attributed to the strong resonance interaction of the O⁻(CH₃)₂SiOSi(CH₃)₂O⁻ group due to the O...Li...O bridges. Orig. art. has: 1 table, 3 figures and 1 equation.

ASSOCIATION: Institut khimii silikatov im. I. V. Grebenshchikova Akademii nauk SSSR (Institute of Silicate Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 20Apr64
NR REF SOV: 003

ENCL: 00
OTHER: 004

SUB CODE: OC, GC

Card 2/2

LAZAREV, A.N.; TENISHEVA, T.F.

Polymorphism of molecules and complex ions in oxygen compounds of silicon and phosphorus. Report No.4: Phase transitions and conformations of the octamethylcyclotetrasiloxane $[\text{OSi}(\text{CH}_3)_2]_4$ molecule. Izv. AN SSSR Ser. khim. no.7:1168-1177 J1 '64.
(MIRA 17:8)

1. Institut khimii silikatov imeni Grebenshchikova AN SSSR.

LAZAREV, A.N.; TENISHEVA, T.F.; DAVYDOVA, V.P.

Reciprocal influence of bonds of the type Si - O - and Si - O(Si). Dokl.
AN SSSR 158 no.3:648-651 S '64. (MIRA 27:10)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR. Pred-
stavleno akademikom N.V.Belovym.

L 52075-65 EWT(h)/T/EMP(t)/EMP(h)/EWA(c) IJP(c) JD/JG

ACCESSION NR: AP5014085

UR/0363/65/001/004/0569/0575

AUTHOR: Tenisheva, T. F.; Lazarev, A. N.TITLE: Infrared spectra and structure of silicates containing divalent rare earth cations

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 4, 1965, 569-575

TOPIC TAGS: lanthanum compound, strontium compound, rare earth, vibration spectrum

ABSTRACT: Silicates of Sm^{2+} , Eu^{2+} , and Yb^{2+} , whose cationic radii are very close to those of Sr^{2+} and Ca^{2+} , were studied by means of infrared spectra and compared with the corresponding Sr and Ca silicates. The compounds investigated were: meta-silicates CaSiO_3 , YbSiO_3 , Eu_2SiO_3 , SmSiO_3 ; pyrosilicates CaSi_2O_7 , $\text{Eu}_3\text{Si}_2\text{O}_7$, YbSi_2O_7 ; orthosilicates Ca_2SiO_4 , Yb_2SiO_4 , Eu_2SiO_4 , Sm_2SiO_4 , Sr_2SiO_4 ; and oxyorthosilicates $\text{Eu}_3(\text{SiO}_4)_2$, $\text{Ca}_3(\text{SiO}_4)_2$, and $\text{Yb}(\text{SiO}_4)_2$. All the compounds were prepared at the Institute of Silicate Chemistry. The infrared spectra were recorded in the 1600-400 cm^{-1} range using an IKS-14 and a UR-10 spectrometer. The data obtained indicate the isostructural character of the compounds in the YbO-SiO_2 and CaO-SiO_2

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L 52075-65

ACCESSION NR: AP5014085

systems, and also in SmO-SiO_2 and SrO-SiO_2 compounds in the EuO-SiO_2 system also appear to be similar (with the exception of $\text{Eu}_3(\text{SiO}_4)_2\text{O}$ and $\text{Eu}_3\text{Si}_2\text{O}_7$) to the corresponding strontium compounds. Hence, extensive possibilities arise for isomorphous substitutions between these cations without lattice distortions. A detailed analysis and interpretation of the vibrational spectra obtained is given for the region of vibrational frequencies of the complex anions, and it is shown that the lattice vibration frequencies do not exceed 400 cm^{-1} in the compounds studied. Orig. art. has: 4 figures and 6 tables.

ASSOCIATION: Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 16Jan65

ENCL: 00

SUB CODE: IC,OP

NO REF SOV: 006

OTHER: 004

Crd 2/2

L 4020-66 EWT(m)/ETC/EWG(m)/EWP(t)/EWP(b) IJP(c) RDW/JD
 ACCESSION NR: AP5022275 UR/0363/65/001/007/1207/1209
 546.65'284:541.7

21
20
B

AUTHOR: Lazarev, A. N.; Tenisheva, T. F.; Bondar, I. A.

TITLE: More about the polymorphism of rare earth pyrosilicates

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 7, 1965, 1207-1209

TOPIC TAGS: silicate, yttrium compound, ytterbium compound, erbium compound, scandium compound

ABSTRACT: The polymorphism of $Y_2Si_2O_7$ was investigated by means of infrared spectra. Earlier, spectroscopic methods were used to establish three types of rare earth pyrosilicate structures: I-La-Eu, II-Gd-Ho, including Y, and III-Er-Lu, including Sc. Two modifications of $Y_2Si_2O_7$ were subjected to IR analysis. The low-temperature modification is found to be similar to group III pyrosilicates, and the high temperature one, to group II pyrosilicates. The polymorphic transformation in $Y_2Si_2O_7$ is reversible but slow and apparently involves a rearrangement of the coordination polyhedra of the cations. The form of the band of the antisymmetric vibration of Si-O-Si in the IR spectrum of $Sc_2Si_2O_7$ indicates a lack of rigidity in this bond, i.e., considerable freedom

Card 1/2

L 4020-66

ACCESSION NR: AP5022275

in the internal rotation and deformation of the angle SiOSi. The IR spectra of Yb₂Si₂O₇, Er₂Si₂O₇, Sc₂Si₂O₇, and Y₂Si₂O₇ are compared. Orig. art. has: 2 figures.

ASSOCIATION: Institut khimii silikatov im. I. V. Grebenshchikova Akademii nauk SSSR (Institute of Silicate Chemistry, Academy of Sciences SSSR)

SUBMITTED: 12Apr65

ENCL: 00

SUB CODE: IC, MT

NO REF SOV: 006

OTHER: 003

Card

2/2

LAZAREV, A.N.; TENISHEVA, T.F.

Spectroscopic aspects of the flexibility of the Si - O - Si bond
in the hexamethyldisiloxane molecule. Opt. i spektr. 18 no.2:217-
226 F '65.

(MIRA 18:4)

L 4288-66 EMT(m)/EPF(c)/EMP(j)/T RM

ACCESSION NR: AP5024004

UR/0020/65/164/002/0357/0360

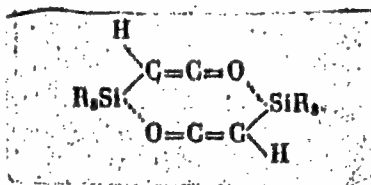
AUTHOR: Shchukovskaya, L. L.; Pal'chik, R. I.; Lazarev, A. N.

TITLE: Synthesis and reactions of trimethylsilylketene-trimethylsiloxyacetylene

SOURCE: AN SSSR. Doklady, v. 164, no. 2, 1965, 357-360

TOPIC TAGS: organosilicon compound, chemical bonding, conjugate bond system

ABSTRACT: Trimethylsilylalkoxyacetylenes decompose at 120 - 130C to yield the corresponding olefin and trimethylsilylketene $(CH_3)_3SiCH=C=O$. The NMR and IR spectra of the product indicate that the ketene formed partially isomerizes into the corresponding acetylene, probably via an intermediate complex with a pentacovalent silicon, e. g.,

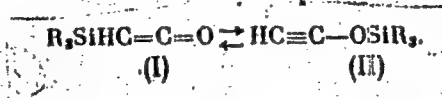


Card 1/4

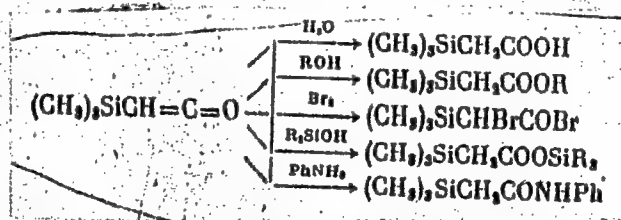
L 4283-66

ACCESSION NR: AP5024004

i. e., the following tautomeric equilibrium exists:



IR spectra of the equilibrium mixture $(\text{CH}_3)_3\text{SiCH}=\text{C}=\text{O} \rightleftharpoons (\text{CH}_3)_3\text{SiO}-\text{C}\equiv\text{CH}$ were recorded, and the conjugation of the Si-O and C \equiv C bonds was deduced (see Fig. 1 of the Enclosure). In the additions reactions studied, the compound reacted in the ketene form as follows:



Card 2/4

L 4288-66

ACCESSION NR: AP5024004

"The authors thank A. S. Khachaturov for taking the NMR spectra." Orig. art. has:
2 figures and 1 table. 44, 55 6

ASSOCIATION: Institut khimii silikatov im. I. V. Grebeshchikova Akademii nauk SSSR
(~~Institute of Silicate Chemistry, Academy of Sciences, SSSR~~) 44, 55

SUBMITTED: 16Feb65

ENCL: 01

SUB CODE: OC, 6C

NO REF SOV: 005

OTHER: 004

Card 3/4

L 4288-66

ACCESSION NR: AP5024004

ENCLOSURE: 01

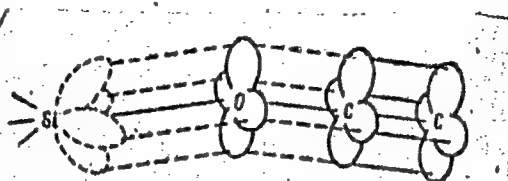


Figure 1. Conjugation of Si-O and C≡C bonds (schematic representation).

Card 4/4

DP

L 5065-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5025506

UR/0062/65/000/009/1553/1556

543.422+546.65

AUTHOR: Tenisheva, T. F.; Lazarev, A. N.; Pavlyukevich, T. M.

TITLE: Infrared spectra of lanthanum germanates

SOURCE: AN SSSR. Izvestiya. ²⁷ ²⁷ Seriya khimicheskaya, no. 9, 1965, 1553-1556

TOPIC TAGS: lanthanum compound, germanium compound, IR spectrum

ABSTRACT: IR spectra of the following four compounds of the $\text{La}_2\text{O}_3\text{-GeO}_2$ system were studied: $\text{La}_2\text{O}_3\cdot\text{GeO}_2$, $2\text{La}_2\text{O}_3\cdot 3\text{GeO}_2$, $\text{La}_2\text{O}_3\cdot 2\text{GeO}_2$, and $\text{La}_2\text{O}_3\cdot 3\text{GeO}_2$. The compounds were synthesized by N. Ye. Prikhod'ko and E. Ye. Kornilova by sintering from the oxides. In contrast to the analogous $\text{La}_2\text{O}_3\text{-SiO}_2$ system, the germanate system includes the additional compound $\text{La}_2\text{O}_3\cdot 3\text{GeO}_2$. It is postulated on the basis of IR data that in this compound, some of the Ge atoms form tetrahedra, and the remaining ones, octahedra. The assumption that some Ge atoms have a sixfold coordination makes it possible to account for the very high intensity of the 634 cm^{-1} band. Unfortunately, the closeness of the vibrational frequencies of

Card 1/2

L 5065-66

ACCESSION NR: AP5025506

Ge-O bonds in germanium-oxygen tetrahedra and octahedra and the strong interaction of these vibrations do not permit any assumptions on the structure of the complex anion in $\text{La}_2\text{O}_3 \cdot 3\text{GeO}_2$ crystals on the basis of spectroscopic data alone. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Institut khimii silikatov im. I. V. Grebenshchikova Adademii nauk SSSR
(Institute of Silicate Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 02Jul63

ENCL: 00

SUB CODE: IC, OP

NO REF SOV: 004

OTHER: 004

Card 2/2 *md*

L 7081-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACC NR: AP5027686

SOURCE CODE: UR/0082/65/000/010/1764/1771

AUTHOR: Tenisheva, T. F.; Lazarev, A. N.; Bondar', I. A.; Vinogradova, N. V.

ORG: Institute of Silicate Chemistry im. I. V. Grebenshchikova, Academy of Sciences SSSR (Institut khimii silikatov Akademii nauk SSSR)

TITLE: Infrared spectra of rare earth element pyrogermanates and structure of the Ge_2O_7 anion.

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 10, 1965, 1764-1771

TOPIC TAGS: IR spectrum, inorganic anion, crystal structure, crystal structure analysis, chemical valence, rare earth compound

ABSTRACT: The types of crystal structures formed by the rare earth element pyrogermanates were determined from their IR spectra, and the structures of these rare earth pyrogermanates and pyrosilicates were compared. Three structural types of pyrogermanates were established: type I--La; type II--Pr, Nd, Sm, Gd; type III--Dy, Y, Er, Yb. The shift, in comparison to pyrosilicates, of

Card 1/2

UDC:543.422+546.65

L 7081-66

ACC NR: AP5027686

the stability limits of each type of structure was attributed to the increased distance between the oxygen atoms in the germanate tetrahedra. The valence angle of GeOGe in the Ge_2O_7 anion increases in going from type I to the type II and III pyrogermanates. As with the pyrosilicate SiOSi angle, the increase in the GeOGe angle is associated with a decrease in the ion radius, reduction in the basicity of the cation and increase in the covalency of the $\text{Ln}^{+}-\text{O}^{-}(\text{Ge})$ bond. "M. M. Piryutko conducted the chemical analysis." Orig. art. has: 2 tables, 4 figures and 1 equation

SUB CODE: IC, GP, SS/ SUBM DATE: 02Jul63/ ORIG REF: 006/ OTH REF: 005

nw

Card 2/2

TENISHEVA, T.F.; PAVLYUKOVICH, T.M.; LEVAREV, A.N.

Infrared spectra and the structure of rare-earth phosphates and sulfates. Izv. AN SSSR.Ser.khim. no.10:1771-1778 '65.

(MIRA 18:10)

1. Institut khimii silikatov im. I.V.Grebenshchikova AN SSSR.

L 12768-66 ENT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)/EWA(h)/EWA(c) IJP(c) JD/HM	
ACC NR: AP6002585	SOURCE CODE: UR/0286/65/000/023/0080/0080
INVENTOR: Lazarev, A. N.; Prokoshkin, D. A.; Il'in, L. S.; Shlykov, O. P.; Tarayeva, M. I.; Novoselov, A. S.; Barashkov, M. A.	
ORG: none	43
TITLE: Brazing alloy for soldering. Class 49, No. 176784	18
SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 80	18
TOPIC TAGS: brazing, titanium, titanium brazing	21
ABSTRACT: This Author Certificate introduces a copper-base brazing alloy for titanium. To lower the melting temperature of the alloy and to increase the strength of joints, the alloy contains 2-4% aluminum, 4-6% tin, 24-26% titanium, and the rest copper.	[ND]
SUB CODE: 13,11/ SUBM DATE: 12May64/ ATD PRESS: 4184	
Card 1/1 HW	UDC: 621.791.36:669.295

LAZAREV, A.N.

Interaction between vibrations and internal rotations in the spectrum
of hexamethylcyclotrisiloxane. Opt. i spektr. 18 no.5:792-797 My '65.
(MIRA 18:10)

4656. OPERATING EXPERIENCE WITH PEAT-WINNING MACHINE AT OZERY PEAT
UNDERTAKING. Lanarev, A.V. (Torfyannaya Promyshlennost,
1949, (6), 15, 16). (L).

LAZAREV, K. V.

36121 Prispobleniye mashiny UMPF-4 dlya uborki ochesa. Torf. prom-st', 1949, No. 11,
S. 11-12.

SO: Letopis' Zhrunal' nykh Statey, No. 49, 1949

LAZAREV, A. V.

Technology

(Mechanizing the winning of cutpeat). Moskva, Gosenergoizdat, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

LAZAREV, A. V.

Peat Industry

Results of the work of the peat-stacking machine OF in 1951. Torf. prom. 29 no. 5, 1952

MONTHLY LIST OF RUSSIAN ACCESSIONS. Library of Congress, August 1952. UNCLASSIFIED.

LAZAREV, A.V., inzhener.

Utilization of night hours for cut peat removal for the improvement of
production quality indexes. *Torl. prom.* 30 no.6:17-20 Ja '53. (MLRA 6:5)

1. Ministerstvo legkoy i pishchevoy promyshlevnosti SSSR. (Peat industry)

LAZAREV, A.V., inzhener.

Indexes of production plan fulfillment for cut peat and indexes of weather
conditions. Torf.prom. 30 no.10:20-22 0 '53. (MLRA 6:10)

(Peat industry)

1. Giproleghprom.

Handwritten note:
The data for the peat industry
is not available.

LAZAREV, A.V., inzhener.

Calculation of the cutting depth per cycle. Torf.prom. 31 no.4:8-11 '54.
(MLRA 7:6)

1. Giproleprom. (Peat)

LAZAREV, Aleksandr Vasil'yevich; VARENTSOV, V.S., redakter; VORONIN, K.P.,
tekhnicheskiy redakter.

[Schedule of operations for winning milled peat] Organizatsiia doby-
chi frezernogo torfa po tsiklevym grafikam. Moskva, Gos. energ. izd-
ve, 1956. 102 p. (Peat) (MLRA 9-5)

LAZAREV, A.V., inzh.

Ways of improving the performance of UMPF peat harvesters.
Torf. prom. 36 no.7:20-24 '59. (MIRA 13:3)

1.Gosudarstvennyy proyektnyy institut - 1 Gosplana RSFSR.
(Peat machinery)

GORENSHTEYN, A.B.; CHUBAROV, N.D.; KOLOTUSHKIN, V.I., red.; LAZAREV, A.V.,
dets., ~~nauchnyy~~ red.; LARIONOV, G.Ye., tekhn. red.

[New machinery for the winning of milled peat] Novye mashiny
dlya dobychi torfa frezernym sposobom. Moskva, Gos. energ.
izd-vo, 1961. 135 p. (MIRA 15:3)
(Feat machinery)

VARENTSOV, Vladimir Semenovich, dots.; LAZAREV, Aleksandr Vasil'yevich,
dots.; BRAGIN, N.A., inzh., retsenzent; AKSENOV, Ye.A., dots.,
retsenzent; VASIL'YEV, A.M., dots., retsenzent; NIKIFOROV, V.A.,
dots., retsenzent; PIMENOV, M.P., dots., retsenzent; SHADURSKIY,
P.A., dots., retsenzent; SEMENSKIY, Ye.P., dots., retsenzent;
FRIDKIN, L.M., tekhn. red.

[Technology of the production of milled peat] Tekhnologiya pro-
izvodstva frezernogo torfa. Moskva, Gosenergoizdat, 1962. 335 p.
(MIRA 15:12)

1. Kalininskiy torfyanoy institut (for Varentsov, Lazarev). 2.
Belorusskiy politekhnicheskii institut (for Aksenov, Vasil'yev,
Nikiforov, Pimenov, Shadurskiy). (Peat)

LAZAREV, A.V.; FILIMONOV, G.F.

Static characteristics of a plane magnetron. Radiotekh. i
elektron 6 no.8:1316-1324 Ag '61. (MIRA 14:7)
(Magnetrons)

S/109/62/007/005/020/021
D230/D308

9.4210

AUTHORS: Filimonov, G.F., and Lazarev, A.V.

TITLE: Static regime of a cylindrical magnetron

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 5, 1962, 911 - 916

TEXT: Formulas are deduced for the cloud density of the spatial charge $n(r)$, its temperature $T(r)$, tangential current $j_\phi(r)$ and electron current flowing towards the anode $j_r(r)$. The electron cloud is assumed to be formed by the electrons leaving the cathode with a certain velocity distribution $f(v)$, moving in a constant electric and magnetic field, and finally reaching the magnetron anode or its cathode. In the direction Oz the magnetron is considered infinite. The present method of deduction is new as compared with the authors' previous method (Radiotekhnika i elektronika, v. 6, no. 8, 1961, 1316), moreover, the results have a much wider application. The region of variation of initial velocities of electrons which corresponds to the electrons passing a point with a given r from cathode to anode, is of fundamental importance for the solution of the inte-

Card-1/2

✓B

Static regime of a cylindrical magnetron S/109/62/007/005/020/021
D230/D308

graphs defining the characteristics and is treated in detail. Graphs of calculated results of anode current versus magnetic field are compared with those obtained experimentally for a magnetron having a plane anode. The agreement is good except for the case of small currents; the difference is in this case explained by supplementary electron sources in the interaction space whose distribution function depends on the energy of 'produced' electrons less strongly than the one assumed in the text. There are 2 figures. ✓ B

SUBMITTED: July 8, 1961

Card 2/2

S/658/62/000/010/007/008
A059/A126

AUTHOR: Lazarev, A.V.

TITLE: Some processes with the single-meson intermediate state

SOURCE: Moscow. Fiziko-tekhnicheskii institut. Trudy, no. 10, 1962. Issledovaniya po fizike i radiotekhnike. 107 - 110

TEXT: Corrections analogous to those performed by J.M. Han and S. Hatsukadze (Preprint, ed. by the Columbia University, USA) on photon-photon scattering due to the presence of the two-photon decay of a neutral ion were calculated for photon splitting in a Coulomb field and the conversion of two photons into two vector mesons, with regard to photon-photon interaction. The matrix element corresponding to the meson pole can be written for photon scattering in the Coulomb field as follows:

$$M_1 = f^2 \int \left[\frac{e_{\mu\nu\alpha\beta} e_{\mu\nu\gamma\delta}}{m^2 + i\Gamma - (k_1 + q)^2} + \frac{e_{\mu\nu\alpha\beta} e_{\mu\nu\gamma\delta}}{m^2 + i\Gamma - (k_2 - q)^2} \right] \times \\ \times A_\mu(q) A_\nu(k_1 - k_2 + q) \cdot q_\alpha (k_1 - k_2 + q)_\beta k_{1\mu} k_{2\nu} \epsilon_{\mu\nu\alpha\beta}^2 dq. \quad (4)$$

Card 1/3

Some processes with the single-meson

8/658/62/000/010/007/008
A059/A126

where $\Gamma = m_\pi/\tau$, k_1 and k_2 are the pulses of the entering and the issuing photons, and A_1 is the Fourier transform of the Coulomb potential. For small-angle scattering, after summing up and averaging with respect to polarizations, the section is independent of the angle and is, in the angular interval $\Delta\theta$:

$$\sigma_{11} = (2\pi)^{-2} f^2 m^{-2} / (\Gamma, \beta) \Delta\theta = 1.28 \cdot 10^{-40} / (\beta z)^2 \Delta\theta \text{ cm}^2;$$

$$f(\Gamma, \beta) \approx$$

$$\approx \left\{ \begin{array}{ll} (\beta^2 + 1)^2 \ln^2 \beta, & 1 - \Gamma < \beta < 1 + \Gamma \\ c_1 \left[\beta \sqrt{1 - \beta^2} - \frac{1}{2} (\beta^2 + 1) \ln (\beta + \sqrt{1 - \beta^2}) \right], & \beta < 1 - \Gamma; \\ c_2 \left[\beta \sqrt{\beta^2 - 1} - \frac{1}{2} (\beta^2 + 1) \ln (\beta + \sqrt{\beta^2 - 1}) \right], & \beta > 1 + \Gamma; \end{array} \right. \quad (5)$$

$$c_1 \sim c_2 \sim 1; \Gamma = 2.25 \cdot 10^{-2}; f m_\pi = 1.5 \cdot 10^{-2}; \beta = \omega/m_\pi;$$

where ω is the energy of the γ quantum. Integration in the matrix element (4) leads to the disappearance of the resonance character of the process. This correction is by many orders lower than the usual expression. For the conversion section of two photons into two vector mesons, the expression

Card 2/3

LAZAREV, Anatoliy Yakovlevich; AKULOV, A.I., redaktor; NEDEYNSKAYA, A.A .
tekhnicheskii redaktor.

[Gas and electric welder] Gazoelektrosvarshchik. Moskva, Ugle-
tekhizdat, 1955. 115 p. (MLRA 8:8)
(Welding)

LAZAREV, Anatoliy Yakovlevich; SEMECHKIN, Leonid Vasil'yevich; APRESOV,
I.M., otvetstvennyy redaktor; SMIRNOV, L.V., redaktor izdatel'stva;
ANDREYEV, G.G., tekhnicheskiy redaktor

[Channelless laying of heat ducts in mines] Beskanal'naya prokladka
teplofikatsionnykh truboprovodov na shakhtakh. Moskva, Ugletekhizdat,
1956. 48 p. (MIRA 9:7)
(Heating-pipes)

LAZAREV, Anatoliy Yakovlevich; FROLOVA, Ye.I., red. izd-va; MAKSIMOVA,
V.V., tekhn. red.; LONILINA, L.N., tekhn. red.

[Dry sealing of armored mine cables] Sukhaia zadelka shakhtnykh
bronirovannykh kabelei. Moskva, Gosgortekhnizdat, 1962. 51 p.
(MIRA 15:6)

(Electric cables)

ACC NR: AP6036436

(A)

SOURCE CODE: UR/0096/66/000/012/0085/0086

AUTHOR: Lazarev, B. F. (Engineer)

ORG: none

TITLE: Conference on steam parameters for 500,000 kw power units and use of nonwater vapors in power engineering

SOURCE: Teploenergetika, no. 12, 1966, 85-86

TOPIC TAGS: scientific conference, electric engineering conference, power engineering conference, Steam power plant, electric power plant, electric power equipment

ABSTRACT: The Scientific Council on "Energetics and Electrification" at the State Committee of the Council of Ministers SSSR on science and technology in cooperation with numerous scientific institutions, organizations, industrial plants, and ministries discussed the problem of steam parameters for electric power units of 500,000 kw capacity. The use of low-boiling agents such as carbon dioxide, sulfur hexafluoride, and freons instead of water in power engineering was one of the topics discussed. The design of a 50,000 kw experimental unit operating on carbon dioxide has been approved by the Ministry of Power and Electrification SSSR. Some details, however, require additional research. An experimental freon 12-turbine unit with a capacity of 1000 kw is now undergoing tests.

SUB CODE: 10/ SUBM DATE: none/ ATD PRESS: 5108.

Card 1/1

UDC: 621.18+621.165.006.3

LAZAREV, B.G.

In the section of consolidated division. Put' i put.khoz. 4 no.11:
3-5 N '60. (MIRA 13:12)

1. Nachal'nik uchastka puti, st. Kalinin, Oktyabr'skoy dorogi.
(Railroads—Track)

KOGAN, V.S.; KRIVKO, A.I.; LAZAREV, B.G.; LAZAREVA, L.S.

Methodology of graphite tin plating. Zav.lab. 30 no.3:317
'64. (MIRA 17:4)

3163. Supraconductivity and the Hall Effect. I. Kikoin and B. Lazarew. *Phys. Zeits. d. Sowjetunion*, 3, 4, pp. 351-365, 1933. In German.— Points out that for most supraconducting metals R_0 at room-temperature is of the order of 10, whilst for most metals which do not show supraconductivity, R_0 is greater than 100. Here R is the coefficient of the Hall effect and σ is the electrical conductivity. The anomalous metals in both series are discussed, and largely explained. An experimental investigation of some alloys and compounds shows that the supraconductors among them exhibit the same distinction as the pure metals.

J. H. A.

ALU-51A METALLURGICAL LITERATURE CLASSIFICATION

100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP AQ AR AS AT AU AV AW AX AY AZ BA BB BC BD BE BF BG BH BI BJ BK BL BM BN BO BP BQ BR BS BT BU BV BW BX BY BZ CA CB CC CD CE CF CG CH CI CJ CK CL CM CN CO CP CQ CR CS CT CU CV CW CX CY CZ DA DB DC DD DE DF DG DH DI DJ DK DL DM DN DO DP DQ DR DS DT DU DV DW DX DY DZ EA EB EC ED EE EF EG EH EI EJ EK EL EM EN EO EP EQ ER ES ET EU EV EW EX EY EZ FA FB FC FD FE FF FG FH FI FJ FK FL FM FN FO FP FQ FR FS FT FU FV FW FX FY FZ GA GB GC GD GE GF GG GH GI GJ GK GL GM GN GO GP GQ GR GS GT GU GV GW GX GY GZ HA HB HC HD HE HF HG HH HI HJ HK HL HM HN HO HP HQ HR HS HT HU HV HW HX HY HZ IA IB IC ID IE IF IG IH II IJ IK IL IM IN IO IP IQ IR IS IT IU IV IW IX IY IZ JA JB JC JD JE JF JG JH JI JJ JK JL JM JN JO JP JQ JR JS JT JU JV JW JX JY JZ KA KB KC KD KE KF KG KH KI KJ KL KM KN KO KP KQ KR KS KT KU KV KW KX KY KZ LA LB LC LD LE LF LG LH LI LJ LK LL LM LN LO LP LQ LR LS LT LU LV LW LX LY LZ MA MB MC MD ME MF MG MH MI MJ MK ML MN MO MP MQ MR MS MT MU MV MW MX MY MZ NA NB NC ND NE NF NG NH NI NJ NK NL NO NP NQ NR NS NT NU NV NW NX NY NZ OA OB OC OD OE OF OG OH OI OJ OK OL OM ON OP OQ OR OS OT OU OV OW OX OY OZ PA PB PC PD PE PF PG PH PI PJ PK PL PM PN PO PP PQ PR PS PT PU PV PW PX PY PZ QA QB QC QD QE QF QG QH QI QJ QK QL QM QN QO QP QQ QR QS QT QU QV QW QX QY QZ RA RB RC RD RE RF RG RH RI RJ RK RL RM RN RO RP RQ RR RS RT RU RV RW RX RY RZ SA SB SC SD SE SF SG SH SI SJ SK SL SM SN SO SP SQ SR SS ST SU SV SW SX SY SZ TA TB TC TD TE TF TG TH TI TJ TK TL TM TN TO TP TQ TR TS TT TU TV TW TX TY TZ UA UB UC UD UE UF UG UH UI UJ UK UL UM UN UO UP UQ UR US UT UU UV UW UX UY UZ VA VB VC VD VE VF VG VH VI VJ VK VL VM VN VO VP VQ VR VS VT VU VW VX VY VZ WA WB WC WD WE WF WG WH WI WJ WK WL WM WN WO WP WQ WR WS WT WU WV WW WX WY WZ XA XB XC XD XE XF XG XH XI XJ XK XL XM XN XO XP XQ XR XS XT XU XV XW XX XY XZ YA YB YC YD YE YF YG YH YI YJ YK YL YM YN YO YP YQ YR YS YT YU YV YW YX YY YZ ZA ZB ZC ZD ZE ZF ZG ZH ZI ZJ ZK ZL ZM ZN ZO ZP ZQ ZR ZS ZT ZU ZV ZW ZX ZY ZZ																									
1ST AND 2ND GRADES																									
PROCESSES AND PROPERTIES INDEX																									
<p>2</p> <p>The transformation of single crystals of white tin into gray tin. A. Komar and B. Lazarev. <i>Physik. Z. Sowjetunion</i> 4, 130-1(1933).—The linear velocity of transformation can be increased 200-300 fold</p> <p>S. Bradford Stone</p>																									
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<p>SECTION: 100-1000</p> <p>100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200</p>																									

LAZAREV, B. G.

Superconductivity and Hall's Effect. Nature, 134, 139, 1934.

1ST AND 2ND CROETS													3RD AND 4TH CROETS												
PROCESSES AND PROPERTIES INDEX																									
<p>ca</p>													<p>9</p> <p>Δ The linear velocity of transformation of white tin into gray. A. Kumar and B. Lazarev. <i>Physik. Z. Sowjetunion</i> 7, 468-73(1935). An electrolytic method of infecting white tin by gray is described. The linear velocity of transformation was measured at temps. from 18° to -80° on thin single crystals. The velocities obtained were 200 times greater than those of Tammann and Dreyer (C. J. 25, 5651). The dependence of the velocity of transformation on supercooling was detd., and possible causes and the influence of pressure are discussed. A. S. Smith</p>												
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																									